Stapleton, Mary Ellen

Map terms used in eight fifth grade geography texts

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MAP TERMS USED IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

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1946

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MAP TERMS USED IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

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CHAPTER I

THE ORIGIN, NATURE, AND FUNCTION OF THE PROBLEM

Problem raising experiences.-- Four definite types of experiences led the writer to consideration of the study of map terms generally needed in fifth grade geography. (1) In teaching fifth grade children in geography, it was apparent at once that a large portion of the vocabulary difficulties which the children encountered, had to do with map terms. (2) In analyzing geographic materials for use in teaching it seemed that a large number of terms were introduced at or near the beginning of fifth grade geography. While many of these terms are essential to the mastery of major geographic ideas presented at that level, some terms not needed at that stage are commonly introduced there, while others which are needed for basic ideas are not introduced at this stage. (3) Both of these situations were strikingly called to the writer's attention by certain persistently recurring inaccuracies on the part of children in upper grade levels, particularly in the junior high area. Such errors as lack of ability to read maps proficiently, and confused thinking in working with maps were readily traceable to failure to have learned the significance of certain map terms basic for thinking

which children were asked to do. In teaching geography to sixth grade children and those in the junior high grades, it was found that many had not gained adequate command of the map terms which they supposedly had met at earlier stages. Consequently, they were frequently weak in ability to gain from maps of appropriate simplicity even the elementary types of ideas which can be read from such maps. (4) Observation of teaching done by student teachers revealed the fact that many of their difficulties arose from their own lack of knowledge of the meaning of map terms as well as their lack of insight into the part which map terms play in geographic work. Furthermore, results of their teaching showed that they failed to realize the necessity for developing slowly, gradually, and thoroughly the vocabulary of map terms essential to sound progress in geographic work.

Crystallizing the problem.-- Out of the experiences just noted a group of other problems arose. Among them were the following:

> "Should such terms as 'latitude,' 'longitude,' 'parallels,' and 'meridians' be introduced at the outset of geographic work?"
>
> "What map terms are needed in mastering the major geographic understandings which is the goal of the first year of work?"
>
> "What vocabulary of map terms is it reasonable to expect children to have well in hand when they enter their second year of geography in grade five?"

> "How can one help prospective teachers to realize the importance of developing this vocabulary?"
>
> "How can one help these teachers to understand means of vocabulary development?"

Inspection of such problems as the above led to realization on the part of the writer that they all had one common root. The perplexities which they implied sprang out of the fact that there is not available for teachers any authentic, scientifically compiled, and carefully graded list of map terms which, taken together, constitute what might be labelled appropriately, "Map Terms in the Elementary Geographic Vocabulary."

It seemed clear that if a list of this type could be compiled scientifically and placed in the hands of all teachers of elementary geography, a long step would be taken toward the solution of many of the common problems similar to those noted. That this need is felt by other teachers in service is brought out by a study made by George F. Howe, assisted by teachers of grades four, five, and six in cities in the state of Connecticut. In reporting on this study, Mr. Howe states in his recommendations that:

> A more careful development of map skills is needed in text books. The mere insertion of maps and their correlation with the text is not enough. A definite map vocabulary should accompany the text, to assist

both teacher and pupil in developing the ability to use maps from the simple to the complex. [1] The many queries in relation to a vocabulary of terms relating to maps crystallized then into the major problems of formulating a list of this character on the fifth grade level.

Impracticability of Handling all Phases.-- Even hasty consideration of this major problem thus derived led to the conclusion that at least two types of investigation were needed in order to throw light upon its solution.

(1) A detailed study of current practices and trends in the use of map terms in fifth grade geographic study was necessary.

(2) An extensive detailed study of the soundness of the practices and trends shown to be prevalent should be made.

The latter would involve an unbiased analysis, quite apart from prevalence of use and uncolored by it, of the specific needs for map terms at the fifth grade level of instruction in question and the specific vocabulary which best meets those needs.

Limiting the Problem.-- To compile a list of map terms now in common use in fifth grade geography teaching, to classify these terms, and to find thereby at least some

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[1] George F. Howe, "A Study of the Ability of Elementary School Pupils to Read Maps," The Teaching of Geography, pp. 491-92. Thirty Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

facts about current practices and trends in their use seemed feasible to accomplish because texts in common use would furnish most, if not all, of the data needed.

It was decided, therefore, to limit the investigation to this phase of the larger problem and to evaluate the practices and trends thus revealed to the extent of recording reactions to them which have grown out of the writer's own objective experience. It was also decided to limit the initial list to terms found in eight representative texts in geography for two reasons.

(1) Inspection showed that very few, if any, map terms not found in at least four of the eight texts selected would be found in other texts in common use.

(2) It was believed that detailed analysis of more than eight fifth grade texts would involve an amount of work disproportionate to the value of the results.

It was realized fully then that the work outlined would result in data and conclusions which would function only as steps in the solution of the larger problem of what a vocabulary of fifth grade map terms should contain. Because it was thought that the findings would contribute toward the ultimate formulation of an authentic list, the phase of the problem which was selected seemed to merit investigation even though its results would be less significant than those obtained from the much more complicated problem evaluation of an extensive detailed study of the soundness of the current practices and trends shown to be

prevalent in the use of map terms in fifth grade geographic study.

In question form, the problems upon which the investigation centered, in turn, then, are the following:

1. What map terms and types of map terms are used in one or more of the selected texts of fifth grade geographies?
2. In so far as revealed by the analysis of the texts selected, what practices and trends in the use of map terms seem prevalent at present on the fifth grade level?

CHAPTER II

SUMMARY OF RESEARCH

In the Thirty-Second Yearbook of the National Society for the Study of Education, on the "Teaching of Geography," there are eighty-two studies which had been made up to and including 1932. Of these eighty-two studies, two relate specifically to problems of vocabulary.

Among the studies reports of which are included in the Yearbook are six so-called minor contributions dealing with abilities, disabilities and difficulties in geography. Two of these, those by Aitchison [1] and by Hart,[2] pertain primarily to problems of vocabulary.

The above studies have nothing in common with the present investigation of "Map Terms Used in Eight Fifth Grade Geography Texts." They are mentioned by the writer to indicate the nature of most of the work which has been done on the vocabulary of geography and more specifically in the field of map terms.

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[1] Alison E. Aitchison, "Torrid, Temperate and Frigid Zones - Sources of Error in Children's Thinking," Investigations in Geography, pp. 483-85. Thirty-Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

[2] Isabell K. Hart, "A Classification of Common Errors in Geography Made by Teachers and Pupils," Investigations in Geography, pp. 479-82. Thirty Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

Howe[3] made a very interesting study on "The Study of the Ability of Elementary School Pupils to Read Maps." In summing up the possibilities tending toward better teaching and learning techniques in the ability to read maps, Mr. Howe offers these recommendations:

> "Elementary school teachers should be aroused in the significance of correct use of maps in commonplace child and adult experience. A re-education of the teacher, herself, through reading and study, is needed for the purpose of correcting errors and weaknesses of old-time teaching instruction and of laying a foundation for scientific, accurate teaching.
>
> "Courses of study should provide for the systematic development of map-reading techniques .... A few things well learned, a few skills well mastered, are more valuable than content crammed into confused and immature minds.
>
> "A more careful development of map skills is needed in textbooks. The mere insertion of maps and their correlation with the text is not enough. A definite map vocabulary should accompany the text to assist both teacher and pupil in developing ability to use maps from the simple to the complex.
>
> "Better teaching techniques are needed. These will no doubt follow in the wake of the factors mentioned above."[4]

In the study made by Hart,[5] the following deductions were made as a result of the study:

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[3] George F. Howe, "A Study of the Ability of Elementary School Pupils to Read Maps," Investigations in Geography, pp. 491-92. Thirty Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

[4] Ibid., pp.491-92.

[5] Isabell K. Hart, "A Classification of Common Errors in Geography Made by Teachers and Pupils," Investigations in Geography, pp. 479-82. Thirty Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

(1) Errors traceable to vocabulary difficulties were due to lack of association of words with correct mental concepts.

(2) Errors were due to lack of association of symbol with mental concept.

(3) Errors were based on lack of skills and abilities.

(4) Errors were based on 'half truths' and misconceptions gathered from unconsidered remarks of the teachers and others.

(5) Errors were based on wrong ideas of cause and effect.[6]

When Aitchison[7] made her study, she found that

> "certain terms introduced in the elementary grades never created in the minds of the pupils the concepts intended. In some cases this was undoubtedly due to the fact that the terms were not well presented by the teacher because of lack of clearness in her own mind or because of lack of time. On the other hand, in some particular lines the misconceptions are so uniform and so widespread as to make it appear that the terms themselves must have something to do with the erroneous ideas that arise and are perpetuated." [8]

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[6] Isabell K. Hart, "A Classification of Common Errors in Geography Made by Teachers and Pupils," Investigations in Geography, pp. 479-82. Thirty-Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

[7] Alison E. Aitchison, "Torrid, Temperate and Frigid Zones - Sources of Error in Children's Thinking." Investigations in Geography, pp. 483-85. Thirty-Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

[8] Ibid., p. 483.

In 1944 Mary Willcockson[9] did a study on "Some Misconceptions of Fifth Grade Children in Geography." She discovered that

> "many misconceptions in geography arise in the intermediate grades because the texts are not supplemented with reference books and visual aids. The only alternative is for textbook writers to make their books much more detailed in content, including an increased number of visual aids. There can be little hope for children to think critically about interpretive relationships if there are misconceptions on the part of children to understand map terms." [10]

Renner[11] made some interesting observations as the result of the war. He found that

> "War has a way of teaching some significant lessons quite apart from the moral issues involved. Probably, the most significant lessons of the present war have been geographical.
>
> "America, almost alone among the great nations, has been accustomed to disregard geography as a major field of scholarship and relegated it to the child's subject in the elementary school rather than one of the foundations of education.
>
> "The war has taught us that few people can read maps, fewer yet can interpret them, and only a very few can make them. And yet there are fewer things more necessary than map skills and terms.

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[9] Mary Willcockson, "Some Misconceptions of Fifth Grade Children in Geography," Journal of Geography, XLIII, 6: 229-35, September 1944.

[10] Ibid., p. 235.

[11] George T. Renner, "What the War Has Taught Us About Geography," Journal of Geography, XLIII, 9: 321-30, December 1944.

"Newspapers are making some novel attempts at map education, running feature articles on lands and people, and editorials on regional and global relationships." 12/

In 1944 Hutter13/ of the State Teachers College, Minnesota, gave a geography test to 500 Air Corps cadets to determine their map skills. He used a diagnostic test. Two sheets were given to each cadet. One contained seven questions and the other was a Mercator Map.

"The following is a list of the questions:

1. Place the directions North,-South,-East,-West in proper positions on the margin of this map.
2. a. Write the terms Equator, Cancer, Capricorn, Arctic Circle, and Antarctic Circle along the proper lines.
   b. Write in the Prime Meridian and International Date Line along these lines.
3. Indicate which of the cross lines are parallels and which are meridians by writing these terms once each along the correct line at some place near the bottom of the map.
4. The parallels and meridians are arranged at 15° intervals. Along the right and bottom of the map label each line correctly for longitude and latitude. Indicate latitude only to the 60th degree but longitude completely.

   Along with the degrees of longitude and latitude you have placed on the map, indicate the proper hemisphere by using N for Northern; S for Southern; E for Eastern; and W for Western.

12/George T. Renner, "What the War Has Taught Us About Geography," Journal of Geography, XLIII, 9:329, December 1944.

13/Harry K. Hutter, "Mistakes Made in Geography by Beginning Air Corps Cadets," Journal of Geography, XLIII, 4:229-35, September 1944.

5. Place these names as nearly as possible on the land masses they represent: North America, South America, Africa, Asia, Australia, Europe, East Indies, West Indies, Madagascar, Greenland, and the Aleutian Islands.

6. Write in these three ocean basins: Atlantic, Pacific and Indian.

7. Locate as nearly as possible and write on the map: Tokyo, Rome, Berlin, London and Washington, D. C.

The following percentages of correct answers were obtained:

Question 1.	95.63
2.a	44.26
b	53.71
3.	46.39
4.	19.25
5.	76.61
6.	84.40
7.	72.77

The above summary clearly indicates that there are many incorrect impressions in the use of symbols and their application. It is necessary to go back into the schools of our land beginning in the grades and to demand a sound program of geographic principles, facts and terms based upon good teaching."[14]

McDavitt,[15] in a recent article, has come to the conclusion that

> "The ability to read intelligently and interpret map terms is one of the prime essentials of successful geography study and enjoyment. Many of us, as teachers, fail to stress map reading and terms and to

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[14] Harry K. Hutter, "Mistakes Made in Geography by Beginning Air Corps Cadets," Journal of Geography, XLIII, 4: 233-35.

[15] Nora McDavitt, "Map Pretests: Devices to Discover the Ability of Pupils to Interpret Maps," Journal of Geography, XLIV, 5: 207-09, May 1945.

realize that pupils are not able to interpret successfully a map unless they are taught to do it. Furthermore, after the initial teaching, we must constantly use maps to help interpret the geography lessons. We must test their abilities, reteach and test again if we would be successful in helping our pupils master this essential geography tool.

"One of the most important lessons which we have learned from this war is that world understanding is the most vital objective in the study of geography. The people have always won the wars. Statesmen, lacking popular support, have invariably lost the peace. If geography is a medium toward peace, then students must be given the same incentive and opportunity to understand it as was provided in the war program.

"Geo-politics becomes an effective medium in world affairs only when a powerful nation implements its precepts."16/

16/Nora McDavitt, "Map Pretests: Devices to Discover the Ability of Pupils to Interpret Maps," Journal of Geography, XLIV, 5: 209.

CHAPTER III

DEFINITIONS, MATERIALS, AND PROCEDURES

Maps, globes, and map terms defined.-- Maps are one type of source material from which children in their study of geography may read, from symbols, facts about the nature and distribution of various features or conditions, natural and man made, that are found on the earth's surface. In this discussion the globe is treated as one type of map.

Under "map terms" are included all those terms, technical, semi-technical, or non-technical, the meaning of which one should know in order to read and express the information he needs to gain from flat maps and globe maps. "River," for example, is a map term because it names

(1) a feature for which one type of map symbol stands and

(2) the map symbol which represents that type of feature.

"Long" and "winding" are map terms because they each designate, for example, a characteristic of a given river which is to be read from a map on which that river is symbolized. One cannot express the information which the map gives about the character of that river without the use of these or synonymous terms.

"Scale of miles" is a map term because it names a measuring device accompanying many maps which enables one to read from them information about another characteristic of rivers and of other features, namely length or extent. "Length" and "extent," then, are map terms because one needs them in stating one type of characteristic or feature which may be read from maps.

"Temperature" and "length of growing season" are map terms because they name conditions symbolized on maps while "isotherm" and "belt" are map terms because they name symbols which represent these conditions.

"Political" is a map term when used to describe a special type of map because the label "Political Map" enables one to interpret certain lines on that map as boundaries between political units.

It is to be noted in the light of these illustrations, then, that map terms, as used in this study, include: the names of features and conditions symbolized on maps, the names of the symbols or complexes of symbols by which those features or conditions are represented on maps, terms (names or descriptive words or phrases) which indicate some characteristic of those features or those conditions which may be read from maps, and terms which name or describe some device on or accompanying the map for the purpose of aiding in its interpretation, or which name the type of map itself.

It is also to be noted that proper names of particular places are not included in the list. This is because such names would be as varied as the particular units presented, would have no value in determining map-reading terms of fundamental significance, and while useful in studies of other types, would merely tend to hamper one in the solution of the particular problems involved in this study. The child does not read a special type of map symbol to discover from a map the name of a given city, but reads the name itself, spelled out as on a page of reading matter. On the other hand, proper names of certain fundamental map symbols, such as Tropic of Capricorn are included under "the names of the symbols by which certain features or conditions are represented on maps" because of their basic importance in map reading, and because symbols for the tropics are distinctive.

Frequently, the child has in his reading or speaking vocabulary various map terms before he comes to the study of geography. In order to make these terms part of his map-reading vocabulary, fresh meanings, technical or semi-technical, need to be attached to them. This may be illustrated by the terms "dot" and "lake," "city," and "dense." The child has used the term "dot" in a general sense, but needs in map reading to link that term to a symbol which may stand for a city or for a given quantity or number of some feature, product or animal, the nature of which he

learns from a map legend. Likewise, he must associate "city" and "lake" with symbols which represent them as well as with the thing symbolized. "Dense" has a special meaning (symbolized on distribution maps) when applied to population, forests, and other map items.

In the case of such terms as "hemi," the feature, the term, and the symbol or complex of symbols may all be new to the child. In this situation he must learn a new term, its pronunciation and spelling, must learn to translate the term into the feature which it represents, and must learn to recognize the symbol for that feature. In addition, he must gain ability to translate the symbol into both the term and the feature before the term becomes a part of his map-reading vocabulary.

These learning situations are well summarized in the following excerpts from the Thirty-Second Yearbook of the National Society for the Study of Education as listed under the following Roman Numerals:

III Observing, recognizing, and naming specific map and globe symbols.

IV Observing, visualizing, and recognizing actual or pictured objects or other natural and human elements signified by specific map and globe symbols.

VI Getting descriptive ideas (real reading as opposed to mere memorization and repetition) of natural and human elements from maps and globes ......

X Expressing descriptive or relational ideas by means of map and globe symbols. 1/

Map terms, then, as here considered, are terms needed in gaining map-reading ability, as contrasted with ability to read the printed page. Selected and learned with their particular or technical meanings for this map-reading purpose, they come, when mastered, to constitute part of one's special geographic vocabulary, and, in turn, part of one's general reading and speaking vocabulary.

Gaining a map-reading vocabulary, then, is an aspect of learning to gain information from maps and from the printed page. In addition, it involves ability to express ideas of the type gained from maps both in map symbols and in words. It is one of the phases of reading covered by the statement from the Twenty-Fourth Yearbook that "..... the reading and study of geographic material (of which maps are an important part) presents a number of reading situations (such as map-reading) which do not occur in other subjects."2/

1/ Edith Putnam Parker, "Investigating the Value of Geographic Offerings," The Teaching of Geography, pp. 80-81. Thirty-Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Co., 1933.

2/ W.S. Gray, and others, "The Relation of Reading to Content Subjects and Other School Activities," Report of the National Committee on Reading, p. 109. Twenty-Fourth Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Co., 1925.

TABLE I

THE TEXTS USED AS A BASIS FOR THE VOCABULARY LISTS *

Text No.	Author	Title	Year
1	O'Connell	Geography of the Americas	1945
2	Atwood Thomas	The American Nations	1945
3	Stull Hatch	Journeys Through North America	1942
4	Smith	American Lands and People	1942
5	Barrows Parker	United States and Canada	1941
6	Bodley Thurston	North America and South America	1941
7	Campbell Nida Webb	The New World Past and Present	1938
8	Benson Huntington McMurry	Living Geography	1937

* See Bibliography for complete titles, authors, publishers, date of publications, etc.

Selection of texts.-- In deciding upon texts to be analyzed it was felt that they should be in wide use at the present time and that they should be reasonably late publications. Of the texts which met these requirements, eight were more commonly used than others in the area with which the writer is familiar. The texts used are listed in Table I.

Procedure.-- The first step toward the solution of the problem was obviously that of formulating a list of map terms used in the series of texts selected for study. With this list as an aim, each text was canvassed. Before the first inspection had gone far, it was evident that in each text there were several sources of map terms. Some terms were found on maps (either in full or as proper names or parts thereof), some were located in the map captions, some in the map legends, and others in the content or activities of the texts.

A work sheet was next made for each text. On each sheet were listed all the different map terms discovered in the text in question together with the type or source in which each term was *first* found. Thus the range or scope of terms in each book was apparent. The terms listed upon these work sheets were then studied for the purpose of discovering categories into which the terms might be divided. Eight categories developed in the course of the examination.

The next step was that of classifying all of the terms listed into these categories. The completed tables (Tables II-IX) indicate the types of sources and the series in which each term in each category is found.

It remained only to summarize the conclusions which were reached through the general procedure described and to evaluate the findings in the light of the author's teaching experience.

CHAPTER IV

TERMS, TYPES OF TERMS, AND FREQUENCIES

Answering the first of the major problems.-- The initial work sheets mentioned in the preceding chapter revealed the total number of terms relating to maps and their significant phrase combinations as they were found in the texts examined. In order to answer the entire question, however, it was necessary to distinguish the various types of terms, one from another and to classify them accordingly.

The matter of choosing categories which would be of value in further work on the general problem of the map reading vocabulary and yet be distinguishable one from another was not simple. One type of classification had been noted in deciding upon a definition for map terms. All terms listed might be grouped into the four categories suggested at that point (p.17).

In the Yearbook on the "Teaching of Geography," another group of categories is suggested by Parker.[1] This group is based on the type of map symbol in connection

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[1] Edith Putnam Parker, "Investigating the Value of Geographic Offerings," The Teaching of Geography, pp. 81-82. Thirty Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

with which a given term is used. It has already been pointed out that certain types of symbols are more easily read than are other types. A classification involving this idea, then, would be helpful.

The following categories would be included in a classification of this type:

1. "Semi-pictorial symbols of natural features, such as land, sea, coast, river, mountain, and ocean current.

2. Semi-pictorial symbols of human features, such as cities, railroads, streets, canals, roads, and political boundaries.

3. Semi-pictorial complexes of symbols that signify natural land or water forms or features, such as peninsulas, isthmuses, straits, continents, islands, lakes, bays, oceans, deltas, valleys, divides, passes, sources, and mouths.

4. Legend or key symbols for scale of miles, feet, or other units of measure.

5. Semi-pictorial complexes of symbols that signify patterns of human features, such as city street patterns, shapes of cities, road patterns, patterns of navigated water routes, railroad nets, and city agglomerations of constellations.

6. Non-pictorial symbols of dot, color-band, or color-spot types that signify patterns of natural features or elements, such as lowlands, highlands, rainfall, vegetation, fauna, minerals, and soils.

7. Non-pictorial symbols of dot, color-band, or color-spot types that signify patterns of human features or elements, such as crop acreage, crop production, population, domesticated animal population, mineral production, lumber production, manufactural production, commercial activity, and any other land or sea utilization pattern.

8. Non-pictorial symbols of types that constitute what is commonly known as the map 'network,' such as meridians, prime meridian, parallels, equator, Tropic of Cancer, Tropic of Capricorn, Arctic Circle, Antarctic Circle, north pole, and south pole.

9. Non-pictorial symbols of the 'iso-line' type (isotherms, isobars, isohyets, contours) that indicate patterns of natural features or elements, such as temperature, pressure, precipitation, and topography.

10. Non-pictorial symbols of the iso-line type (isopleths) that indicate patterns of land or sea utilization." 2/

If these categories were used exclusively, however, little would be revealed regarding the functions of the various terms. This point would be shown more clearly by the first classification suggested.

In the third place, if only individual words which make up significant phrases were listed, little value would be revealed so far as meaning of the term is concerned in many cases. The phrase as a whole expresses the idea to be read. In such cases one might know the various terms in other combinations, but not in the specific one involved. It was clear, then, that word combinations or phrases as well as individual terms would need to be included in a final vocabulary. On the other hand, to include separately all combinations in a refined list would involve much near-duplication. This would mean a list, which, because of its mere length, would tend

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2/Edith Putnam Parker, "Investigating the Value of Geographic Offerings," The Teaching of Geography, pp.81-82. Thirty-Second Yearbook of the National Society for the Study of Education. Bloomington, Illinois: Public School Publishing Company, 1933.

partly to obscure the emphasis upon critical terms and types of combinations.

In the light of these considerations, this question arose in the writer's mind, "Is there not possible some group of categories which, with as little duplication as possible, will indicate

(1) function of the term
(2) type of map symbol involved, and
(3) types of significant phrase combinations?"

Determination of categories.-- In the perusal of the list, it was evident that a group of non-technical or semi-technical terms were used in indicating the symbolic nature of map language, the general nature of the symbols used, and the devices accompanying maps of all types as an aid in their interpretation. Since these terms are used in connection with all maps and are fundamental in leading one to understand maps, it was decided to put them into the first category which was labelled, "Terms Used in Describing the General Nature of Maps and Map Symbols." It is to be noted, then, that this category was based on function, not on type of symbols.

Further, it is to be noted that in this category terms indicating what the symbols signify are not entered; neither are the names of types or symbols which are used only in connection with specific types of maps. The latter class of terms is reserved for the categories of

terms relating to those particular types of symbols. For example, "isotherm" is not included because though it names a type of map symbol, it indicates by the term itself the particular type of line that it is. In explaining the term "isotherm" the general term "line" is used just as the term "line" is used when noting the symbol for "river." "Line" then is entered in this general class while the term "isotherm" is reserved for a later category.

Perhaps the nature of this first category can be made still clearer by noting that all the terms in it might be used in defining a map and the interpretive devices which are necessary for map reading. They are the terms one used in showing (1) that a map consists of "dots," colored "bands," "spots," etc., which "stand for" or are symbols for various ideas or features "represented" on the map in question, (2) that there are on maps "straight lines," "dotted lines," etc., as well as "blue," "uncolored" and other kinds of lines, spots, or bands to "stand for" or "represent" many different kinds of actual things found in the region mapped. (3) Symbols on maps tell facts about the particular region mapped. They make up "map language" just as words make up a word language.

All terms other than those in the first category could readily be classified, both as to type or symbol

involved and as to function. As an intermediate step they were divided into Class A, those relating to semi-pictorial single symbols. These terms were listed under the eight following headings:

1. "Natural Features," such as "cataract," "glacier," "fall line," "coast," etc.

2. "Cultural Features," such as "air port," "canal," "railroad," "tunnel," etc.

3. "Names of Types of Characteristics," such as "size," "depth," "length," height," etc.

4. "Adjectives Indicating Kind or Nature of Features Shown," such as "sunken," "bare" (mountain), "dry" (land), "main" (stream), "chief" (seaport), "international" (boundary), etc.

5. "Adjectives Indicating Size, Shape, and Number of Features," such as "big," "extensive," "winding," "narrow," etc.

6. "Adjectives Expressing General Location," such as "central," "interior," "distant," "nearby," etc.

7. "Prepositional Phrases Expressing General Location, Direction or Nature of Features," such as "toward the" (land), "up the" (river), "down stream,""near the" (coast), etc.

8. "Terms Naming Activities Indicated by Symbols," such as, "trading," "manufacturing," "fishing," "transportation," etc.

Under Class B were placed those terms relating to complexes of semi-pictorial symbols. In this group were the following headings:

1. "Nouns Naming Natural Features," such as "archipelago," "canyon," "continent," "delta," "zone," "hemisphere," etc.

2. Nouns Naming Cultural Features," such as "port," "seaport," "steamship service," etc.

3. "Combinations of Terms Naming Natural Features," which included "drainage basin," "river valley," "gulf stream," "glacial drift," etc.

4. "Phrases Naming Some Part of Natural Features," such as "mountain peak," "foot of the mountain," "source of the river," etc.

Under Class C were placed those terms relating to color band, spot, or dot symbols of the non-pictorial type. This classification was a very varied one. It included the following seven types of terms:

1. "Area Names," such as "belt," "field," "region," "territory," etc.

2. "General Distribution and Amount Terms," such as "amount of," "acreage of," "density of," "proportion of," etc.

3. "Names of Items, Distributions or Amount of Which is Shown," such as "inhabitants," "beef cattle," "desert vegetation," "woodland," "prairie," "cotton," "rice,"

"factories," "lumber," "coal," "petroleum," "iron ore," "parks," "soils," etc.

4. "Names of Conditions or 'Non-Feature' Items," such as "altitude," "rainfall," "aridity," "temperature," "climate," etc.

5. "Prepositional and Conjunctive Phrases," such as "(1 dot) equals (100 people)," "(rainfall) less than (10 inches)," "population per (square mile)," "feet above (sea level)," etc.

6. "New Significant Terms Found in Qualifying Phrases," such as "summer," "winter," "bales," "bushels," etc.

7. "Adjectives Naming Ideas about Amount and Distribution, such as "hot," "forested," "irrigated," "sparse," "barren," "semi-desert," etc.

Under Class D were those terms relating to orientation symbols. Orientation symbols, Class D, while constituting a distinct group of symbols, are not confined to any special type of map. They occur on maps that otherwise are semi-pictorial in character as well as on maps of more abstract types. It seems, then, in proceeding from general to more specific types of map terms that terms relating to orientation types of symbols should be dealt with in the next category or categories.

Study of this orientation group revealed that with regard to function the terms fall into two major groups, (1) terms naming the specific orientation symbols, not

merely as lines or dots, but by the names which give them special meanings, as "equator," "tropics," "Arctic Circle," "central meridian," etc., (2) terms and phrases used in expressing the ideas to be read from orientation symbols. It is to be noted that orientation as here used means "relative location," and involves accordingly the idea of "distance from" one feature to another. It further involves the idea of "trend" or of "direction of" of one feature from another, such as "far from the equator," "in west longitude," "far to the north," "in north latitude," etc.

In the light of the foregoing distinctions orientation symbols were divided into two categories both having to do with that particular type of symbols, but differing in function. These were labelled respectively, "Terms Naming Specific Orientation Symbols," and "Terms Used in Expressing Descriptive Ideas to be Gained from Orientation Symbols," and listed in Tables III and IV.

Similarly, the terms in the major classes A and B, those relating to semi-pictorial symbols fell into two categories according to function. Since the descriptive terms relating to each were so much alike, it was decided to list the feature terms in Class A in one table and the feature terms in Class B in another table. This left for a third table the descriptive terms relating to both types.

Table V was then called "Terms Naming Features Represented by Individual Semi-Pictorial Symbols," and Table VI, "Terms Naming Features Represented by Complexes of Semi-Pictorial Symbols," and Table VII, "Terms Used in Expressing Descriptive Ideas about Features Represented by Semi-Pictorial Symbols."

In Class C, which included the color band, spot, and dot types of symbols, the distinctive function of the terms could be recognized, but the very nature of the things expressed by these symbols made it impracticable to put in separate tables the things symbolized and the terms describing those things. Largely, these symbols indicate features only by implication. On maps using these symbols, density of color and number of spots indicate not individual features as do semi-pictorial symbols, but number or amount of distribution of given features or conditions.

Color bands, dots, and spots also indicate regions or zones, differentiated one from another on some particular basis, such as, for example, density of population. To indicate the nature of these regions, the entire phrase "density of population" must be used. "Density" alone names only the general type of descriptive ideas to be gained and gives no definite idea of just what is symbolized. Similarly, if "region of heavy rainfall" were separated into "region" and "of heavy rainfall"

the particular thing which the map symbolizes is not clear. The descriptive part of the phrase constitutes part of the name of the thing symbolized; "region," "density," and "distribution," used without qualifying phrases, are indefinite. This was not the case with the semi-pictorial terms. "Mountain" names a distinctive feature whether it be high or low, large or small, steep or with gentle slopes.

Because of this very close phrase association of terms used in connection with symbols of this group, all types of terms relative to color band, dot, or spot symbols were listed in one table (Table VIII) which was labelled, "Terms Used in Reading Color Band, Spot, and Dot Symbols."

There remained to be classified only Class E, terms relating to iso-line types of symbols. As in the case of Class C, this type is more highly abstract in nature than the other types listed. The distinctive function could be recognized, but there was the same close phrase association. In this classification the two following types of terms were listed:

1. "Types of Items Distribution of Which is Shown," such as "advance" (of boll weevil), "length" (of growing season), "average date of first strawberry crop," etc.

2. "New Significant Terms Used in Describing Items," such as "boll weevil," "growing season," "cold waves," "cyclone path," etc.

The iso-line symbols indicate the same types of things as those indicated by color band, spot, and dot symbols in a more abstract way. They were left in one category (Table IX), and entitled, "Terms Used in Interpreting Iso-line Symbols."

The categories as tabulated are:

1. Terms used in describing the general nature of maps and map symbols.
2. Terms naming specific orientation symbols.
3. Terms used in expressing descriptive ideas gained from orientation symbols.
4. Terms naming features represented by individual semi-pictorial symbols.
5. Terms naming features represented by complexes of semi-pictorial symbols.
6. Terms used in expressing descriptive ideas gained from semi-pictorial symbols.
7. Terms used in reading color band, spot, and dot symbols.
8. Terms used in interpreting iso-line symbols.

Terms used in describing the general nature of maps and map symbols.-- Thirty-nine terms or combinations of terms, as listed in Table II, were selected from the initial work sheets as belonging to this category. Among them were "red lines," "thin lines," "straight lines," "economic map," "political map," "legend," "symbol," "degree," and the like.

To prevent unnecessary duplication and to reduce these phrases as nearly as practicable to a list of

single words and yet indicate combination, the nouns naming the symbols were listed in one group and the descriptive words, whether adjectives or phrases, in a second group with indication of the noun or nouns to which they were linked. The verbs used in explaining the function of the symbols were placed in a third group.

In so far as seemed helpful in discerning the general character of the descriptive words, they were grouped according to the type of characteristic which they indicated. The sub-titles in the first column of the table itself indicate the nature of these minor groups.

Analysis of Table II.-- Examination of the list as thus simplified, refined, and grouped reveals that some of the terms, such as "solid," "straight," and "heavy," though needed in describing map symbols, are so commonly used in other connections that knowledge of them might well be expected as a part of a child's general vocabulary. On the other hand, some of the terms, even though used in various other connections, have a special meaning in this usage or are used in a special connection. "Legend," "globe," and "physical" (map), are terms of this latter type.

It is to be noted that of the list as a whole, six terms (15 per cent of them) occurred in all of the texts examined. Consideration of the words which do not occur in all the texts suggests some probable reasons for

TABLE II

TERMS USED IN DESCRIBING THE GENERAL NATURE OF MAP SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source Map Text								Map Legend Text								Map Caption Text								Context Text								Activities Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Nouns Naming Symbols																																								
map																	x								x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
dot									x		x	x		x			x				x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
globe																									x			x	x		x		x			x			x	
legend									x								x								x	x		x		x	x	x								
line																	x								x		x		x		x									
key									x		x		x	x											x			x	x			x								
plan (ground)																	x								x		x		x		x									
symbol (for)																									x		x	x		x			x							
scale									x			x					x								x															
degree																	x								x			x		x		x	x							
B. Descriptive Terms(adj.) Expressing																																								
1.Color relating to																																								
black lines																	x		x	x		x																		
brown																																	x			x				
blue dots																																	x		x	x				
green																									x									x						
red																																		x		x		x		x
2.Number, Quality or Nature																																								
few																	x		x		x	x			x															
heavy lines																									x		x	x			x		x		x	x			x	
large(scale) dots																	x	x		x		x			x	x		x			x		x		x	x	x		x	
dotted																	x	x	x			x			x	x	x			x										
slanting lines																	x		x		x				x	x	x						x	x	x					
sloping "																									x								x							
solid "																	x		x		x				x		x		x											
straight "																									x		x		x	x			x		x	x	x			
cross-barred "																	x	x		x	x																			
unlettered "																																		x	x	x		x		
thin "																																	x	x	x	x				

TABLE II (continued)

TERMS USED IN DESCRIBING THE GENERAL NATURE OF MAP SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Map								Map Legend								Source Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
3.Type																																								
economic																	x	x		x	x				x	x		x	x			x	x	x	x			x		
human use (pop.)																	x	x		x	x		x		x	x		x	x		x		x	x	x		x			
outline																	x	x	x	x		x			x	x	x					x	x	x	x					x
physical																	x		x	x		x			x	x	x	x	x	x	x	x	x	x	x		x			
political																	x	x	x		x			x	x	x	x	x	x	x	x	x	x		x		x			
regional																	x	x	x	x				x	x	x		x	x		x		x	x	x		x			
relief																	x		x	x		x			x	x		x	x		x		x	x		x		x		
air																	x	x		x			x	x	x	x	x	x					x	x		x		x		
rainfall																	x	x		x			x	x	x			x	x	x		x	x	x		x		x		
vegetation																	x	x		x			x	x	x		x	x		x			x	x		x	x	x		
global																	x	x	x	x			x	x	x	x	x	x					x	x	x	x			x	
C. Descriptive Terms(verbs)																																								
stands for																									x	x			x			x	x	x	x		x			
represents																									x	x	x	x	x	x	x	x	x		x		x	x		

Total - 39 Terms

variation. (1) Texts differ in the amount of explanation of the geographic tools they present. Some authors discuss these tools in detail in the text, while others leave the responsibility for this explanation to the teacher. For this reason it is clear that a list of map terms derived from texts alone may need to be supplemented by terms which the teacher needs to use in helping children to understand the maps and map symbols represented. (2) Some of the terms listed are synonymous. "Key," for example, means the same as legend. "Symbol for" and "sign for" are identical in their meaning as applied to maps. "Stands for" expresses the same idea as "represents." One author may use "key" instead of "legend," while another consistently may use "key" throughout and a third introduces both. This preference is further exemplified by the use of the terms "tributary" and "cataract" by some authors and "branch" and "falls" by others. (3) For certain types of features (railroad, for example) there are no standard symbols, and a feature symbolized by a red line, for instance, on the maps in one book may be symbolized by broken black lines on the maps in another book.

These three considerations obviously lessen the significance that otherwise might be attached to the fact that some terms are not found in all texts. A term found in only one text might be just as fundamental as if it occurred in all. Synonymous terms might be found in

other texts or it might be the policy of the other texts to leave to the teacher the responsibility for presenting the term. On the other hand, a term used in only one text might be one for which there is a commonly used term which will serve as well or better. In this case the use of the term adds unnecessarily to the number of terms in a map vocabulary. These facts point to the need for further study of terms from the standpoint of revaluation.

Terms naming specific orientation symbols.-- Eighteen terms were classified in this category as shown in Table III. Most of them consist of two or three words but were listed as single terms instead of separate words because as phrases they constitute names applied to special symbols. Thus, "prime meridian" is considered as one name instead of as two terms. The term "meridian" is entered also as a single term because it frequently is used singly. It is to be noted, however, that if "meridian" were entered as one term and "prime" were separated from it and put in the next category of descriptive terms relating to orientation the total number of terms entered in the two categories would not be altered thereby. Furthermore, "prime" by itself has uses in geographic material other than those associated with map terms. These comments suggest one type of difficulty met in classifying certain "border line" terms, which on one basis would go into one group and on another basis into a different group. In all such

debatable cases, the terms were classified in the way which seemed to the writer to throw most light on their place in a map reading vocabulary. Since "prime" as it relates to maps is used only in conjunction with "meridian," it seemed in this case best to treat "prime meridian" as a single term. Wherever in any category several common combinations of two terms occur, the types of combinations were shown as in Table II by the notation "relating to line, dot or map" after certain terms listed singly. Such variation in procedure, then, does not represent inconsistency with regard to the general principle or procedure employed, although it is recognized that in some cases there might be difference of opinion concerning the writer's application of that principle.

It is to be noted that in Table III the symbols "scale of miles" and "scale bar" are the only two symbols which appear as legend symbols.

Analysis of Table III.-- The totals show that ten of these eighteen terms (55.5 per cent of them) were used in all eight texts. The fact that some of the other do not occur in all may be accounted for in much the same way as were differences in frequencies in Table II. The terms in this category are those one would not expect to find in map captions, nor in map legends with the exception of "scale of miles." One would expect to find nine of them - as they are - on maps in all texts and might well expect all of them to be mentioned in the descriptive

TABLE III

TERMS NAMING SPECIFIC ORIENTATION SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Referring to Map Symbols																																								
Antarctic Circle	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x		x	x	x		
Arctic "	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x		x	x	x		
east-west line																									x	x		x	x		x		x			x				
north-south "																									x	x		x	x		x		x			x				
lines of latitude																									x	x		x	x	x	x		x	x		x				
lines of longitude																									x	x		x	x	x	x		x	x		x				
parallel	x	x		x				x									x	x	x		x		x		x	x	x	x	x	x	x	x	x	x	x		x			
meridian	x	x	x	x				x									x	x	x		x		x		x	x	x	x	x	x	x	x	x	x	x		x			
prime meridian																									x		x		x											
equator	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
north pole	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
south pole	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Tropic of Cancer	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Tropic of Capricorn	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
length of day line																									x	x		x		x			x		x					
noon position of sun line																									x	x		x		x			x		x					
B. Referring to Legend Symbols																																								
scale bar									x	x	x	x	x	x	x										x		x	x												
scale of miles									x	x	x	x	x	x	x	x	x					x			x		x	x		x		x	x	x		x				

Total - 18 terms

matter or activities of the text in which they occur. It is interesting, therefore, to find that in some texts the terms "meridian," "parallel," "Arctic Circle," "Antarctic Circle," "scale of miles," "Tropic of Cancer," and "Tropic of Capricorn" are found on maps, in the legend or in the caption. This means that responsibility for the children's understanding of these fundamental terms is left entirely with the teacher.

Terms used in expressing descriptive ideas from orientation symbols.-- From the initial list of 502 words or phrases selected from the work sheets as belonging in this category, Table IV was compiled.

Several groups of terms, as indicated in the table, were recognizable by reason of the specific lesser functions they served in aiding in the major function of expressing descriptive ideas to be gained from orientation symbols. For example, three such descriptive ideas as a whole may be expressed as follows: (1) The distance of A from the equator, i.e., its latitude, is seventy degrees. It is in north latitude, north of the Arctic Circle, which is a "length of day" line. (2) The map in Figure I is drawn on a larger scale than the one in Figure 2. (3) Place A is three hundred miles northwest from Place B.

In those sentences the terms "distance," "latitude" and "scale" each name a type of characteristic of given features or maps which is shown by the orientation symbols

or devices.

In the table such terms are called, for the sake of brevity, merely "General Nouns." This sub-title, then, stands for "General nouns used in naming the type of characteristic to be read from orientation symbols." In some cases ("length of day," for example), the type of characteristic was named by a noun phrase instead of a single noun.

In the illustrative sentences, "northward to A," "toward the North," "in north latitude" are prepositional phrases used in denoting specific location. Since it was the writer's experience that children frequently confuse orientation facts because of difficulty with such combinations as "distance from A to B," "location in west longitude," it seemed necessary to include such prepositional combinations as a separate group of vocabulary terms. The point is that a child may use these phrases repeatedly and may know what "direction" means, and yet be confused by the phrase "direction from A to B." Since these combinations are a common and vital part of statements expressing descriptive ideas to be read from orientation symbols, it seemed they should be entered as fundamental combinations.

To have entered each and every such phrase found, however, would make for unnecessary duplication. For A and B in the phrase "direction from A to B" might be substituted, for example, the name of any orientation line

named in Table III, the name of any specific place, such as Chicago, or the name of any feature, such as mountain, coast and the like. For "north" in the phrase "from the north" might be substituted the name of any other direction. These were listed in the table merely once for each type of prepositional combination, and with them were entered in parentheses, words which indicate the general nature of the use of such phrases in the expression of these orientation ideas as a whole, e.g., (distance) from A to B.

Referring again to the three illustrative sentences, one may note that specific distance ideas cannot be expressed without the use of terms, such as "miles" and "degrees" which are units of distance measurement. Such words are grouped in the table under the heading "Terms of Distance."

The remaining significant terms in this category fell into a group of nouns naming directions, tabulated under the heading of "Direction Nouns," and a second group of "Direction Adjectives and Adverbs." It seemed wise to separate the nouns and qualifying terms because differences in their function in an orientation statement may cause a child difficulty.

It was apparent after detailed work upon the terms in this category, that classification of this type was in many cases baffling. It also involved some necessary lack of uniformity in the way in which given types of terms were listed. Further, it was exceedingly difficult to

show the significant combinations so as to avoid duplication. Nevertheless, it seemed worth while to continue thus to subdivide other categories because of the light such classification throws on the variety of minor words and word uses that are needed in expressing facts read from maps.

The general policies formulated in connection with work on this category, together with those which had grown out of work on earlier categories, aided in work with further subdivision of terms on the later ones. An attempt was made throughout to follow as consistently as possible such policies as had developed.

Analysis of Table IV.-- Of the forty-eight terms listed on this table, only fifteen (31 per cent) were used in all texts. Of these fifteen terms, however, eight are direction names, such as "north," "south," etc. The definite need for these terms may in part account for their general use as exhibited in this table. Because of their place in the everyday vocabulary of children, one might conclude that there would be no need for definite teaching in relation to these terms. However, experience with children who are not geographically minded revealed to the writer that although they may know the words, they do not know the meaning, or knowing the meaning, cannot make application of it. Accordingly, the emphasis put upon these terms seems warranted, but the texts probably should

TABLE IV

TERMS USED IN EXPRESSING DESCRIPTIVE IDEAS GAINED FROM ORIENTATION SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. General Nouns Naming Types of Ideas (to be gained about features)																																								
direction																	x		x	x					x	x	x	x	x	x	x	x	x	x		x	x			
distance																									x	x	x	x												
latitude																									x	x	x	x	x	x	x	x	x	x	x		x			
longitude		x						x										x							x	x	x	x	x	x	x	x	x	x	x	x				
location																									x	x	x	x	x	x	x	x	x	x	x	x				
length of day																									x		x	x		x			x		x	x				
position of noon sun																									x		x	x		x			x		x	x				
scale (on which map is drawn)																									x			x												
B. Prepositional Phrases (direction or distance)																																								
away from A																									x	x		x		x										
from A to B																											x		x	x										
of A to B																									x	x		x	x	x										
from A																									x	x		x	x	x		x								
to A																									x	x		x	x			x								
toward A																									x	x		x	x			x								
from the north																									x			x	x			x								
toward the "																									x	x		x	x											
northward to A																									x	x		x	x				x		x	x		x		
location of A																									x			x	x				x		x	x		x		
in (north) latitude																									x		x		x			x								
in (west) longitude																									x		x		x			x								
near to the equator																									x		x	x		x			x		x		x			
far from " "																									x		x	x		x										
close to the equator																									x	x		x	x		x									
far to the north																									x	x		x	x		x									

TABLE IV (continued)

TERMS USED IN EXPRESSING DESCRIPTIVE IDEAS GAINED FROM ORIENTATION SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
C. Terms of Distance																																								
miles									x																x	x		x		x										
degrees (of latitude and longitude)	x		x	x		x		x																	x	x	x		x				x		x		x			
statute miles										x															x	x		x					x		x		x			
hundreds of miles																									x	x		x	x				x	x		x				
nautical miles										x		x		x	x										x	x		x	x		x		x	x		x	x			
hours of daylight																									x	x	x	x	x		x									
D. Direction Nouns																																								
North	x	x		x		x																			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
East	x	x		x		x																			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
South	x	x	x		x																				x	x	x	x	x	x	x	x	x	x		x	x	x		x
West	x	x		x		x																			x	x	x	x	x	x	x	x	x	x		x	x	x		x
Northwest																									x	x	x	x	x	x	x	x	x	x		x				
Northeast																									x	x	x	x	x	x	x	x	x	x		x			x	
Southwest																									x	x	x	x	x	x	x	x	x	x		x			x	
Southeast																									x	x	x	x	x	x	x	x	x	x		x			x	
E. Direction or Location (adj. and adv.)																																								
due (north																									x		x	x		x	x		x		x					
westerly																									x		x	x		x	x		x		x					
northernmost																									x		x	x		x	x		x		x	x				
southwestward																									x		x	x		x	x		x		x	x				
northern land																									x	x	x	x	x	x	x	x	x	x						
eastern																									x	x	x	x	x	x	x	x	x	x						
western																									x	x	x	x	x	x	x	x	x	x			x			
southwestern																									x		x	x					x							
southern limit																									x	x	x	x	x	x	x	x	x	x			x			
extends north																									x	x		x	x				x	x		x				

Total - 48 terms

be supplemented by oral instruction.

The remaining thirty-three terms in the list were found in from one to seven texts. The series frequency, however, may have little significance, for as has been pointed out, great variety in phraseology existed in the initial list. This meant that two or three writers could express the same idea in different or synonymous words. Use of the terms in less than eight texts, then, is not of necessity an indication of lack of agreement among these writers of texts upon fundamentals, but may rather be a difference in selection of terms to use in expressing the descriptive ideas to be gained from orientation symbols.

The fact that the greater number of all terms in the list appears in the body of the texts means, probably, that though the writers concerned do use different forms of expression, they feel responsibility for presentation of terms of this type rather than leaving all of this work in the hands of the teacher.

What has been said regarding need for "teaching emphasis" on direction nouns also applies in part to the prepositional phrases in the list. The ideas expressed by these phrases are such that the child probably could not be expected to master them without aid of the teacher, regardless of the amount and quality of instruction given in the text. It is to be noted that prepositional phrases constitute the largest group of orientation terms. In

this group the ideas centered around distance, direction, location, etc., are so varied and so numerous that unless the teacher guides, the child is apt to become confused in his interpretation of the term.

Terms naming features represented by individual semi-pictorial symbols.-- Twenty-three terms were classed in this category. With very few exceptions they denote clearly some feature easily distinguishable upon maps, such as "coast," "city," etc.

As shown in Table V, the only attempt at grouping was to separate the natural from the cultural features. This was done with the idea that such grouping would be helpful in making clear these two types of ideas.

Whether the terms, "earth," "world," and "fall-line" should be classed in this category or with complexes or symbols depends upon their treatment in the texts. As classified, the sign for "earth" or "world" is the simple round, flat ball picture on the page of the text. If upon this symbol were imposed other symbols for the "continents," "oceans," etc., the terms "earth" and "world" would need to be classed in the next category, that given to complexes of semi-pictorial symbols. If the child understands the single symbol, he does not become confused when he meets the complex.

Analysis of Table V.-- Examination of the twenty-three terms reveals that seventeen of them (73.9 per cent)

TABLE V

TERMS NAMING FEATURES REPRESENTED BY INDIVIDUAL SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Terms Naming Natural Features																																								
cataract	x		x		x																				x	x	x	x	x	x	x	x	x		x	x				
coast									x		x														x	x	x	x	x	x	x	x	x	x	x	x	x	x		
earth																	x		x	x		x			x	x	x	x	x	x	x	x	x	x		x	x			
fall line																									x	x	x		x	x			x	x		x	x			
falls	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x	x		x	
glacier	x		x	x		x		x									x		x	x		x			x	x	x	x	x	x	x	x	x	x	x		x	x		
mountain	x	x	x	x	x	x	x	x	x		x	x		x		x	x		x	x		x			x	x	x	x	x	x	x	x	x	x	x		x	x		
river	x	x	x	x	x	x	x	x		x			x				x		x	x		x			x	x	x	x	x	x	x	x	x	x	x		x	x		
world																	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x		
floating ice									x	x							x		x	x																				
B. Terms Naming Cultural Features																																								
airport									x	x	x						x	x	x						x	x	x	x					x	x	x	x				
boundary									x		x	x		x											x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
canal	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x									x	x	x	x	x	x	x	x	x	x		x	x	x		
capital									x		x	x	x				x		x	x		x			x	x	x	x	x	x	x	x	x	x	x	x		x		
city	x		x		x	x		x	x		x	x	x												x	x	x	x	x	x	x	x	x	x	x	x				
highway									x		x		x												x		x	x		x										
railroad	x	x		x		x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x				
road	x		x	x				x	x		x	x													x	x	x	x	x	x	x	x	x	x	x	x		x		
street	x		x	x		x																			x	x	x	x	x	x	x	x	x	x		x				
town									x		x	x			x										x		x	x												
tunnel									x	x			x				x	x		x					x	x	x	x	x	x	x	x								
route	x		x	x		x		x	x		x	x		x			x	x		x					x	x	x	x	x	x	x	x	x		x	x				
trail	x	x	x		x				x		x	x		x			x	x		x					x		x	x		x			x		x	x				

Total - 23 terms

are used in all texts. This, then, points to the significance of these terms and what the necessity might be in a map vocabulary. In spite of the fact that they are apt to be familiar to the child before he begins the study of geography, all except four of the writers of the texts examined give attention to all of these specific terms in the descriptive materials of their texts. This may point to intention on their part to bear responsibility for presentation of these terms rather than leave this function to the teacher, wholly or in part. On the other hand, the very necessity for the terms themselves may demand this thorough type of presentation.

Variety in the sources for these terms also points to the supposition that the writers feel the terms to be fundamental.

Terms naming features represented by complexes of semi-pictorial symbols.-- Seventy-five terms were listed in this category as shown on Table VI. As in the case of the preceding list, all terms were assigned to either a group naming natural features or one naming cultural features. Unlike the terms of the single semi-pictorial list, only seven of the seventy-five terms fell into the cultural group. The cultural features relating to service, traffic, and the term "railroad net," were placed in this category because they are represented by "line" symbols which are semi-pictorial in nature.

Twenty-three of these terms are expressed by means of word combinations. This necessitated such grouping of words as has been discussed in relation to the terms in category III. Just as it was difficult there to separate the terms "prime" and "meridian," such combinations as "lake plain," "mouth of the river," and "mountain range," in this category brought up a similar problem and were handled in like manner. This means that word combinations as well as single words, then, were listed under each group of natural or of cultural features.

Analysis of Table VI.-- Study of this table brought out that of the seventy-five terms listed, twenty-nine (36.3 per cent) were found in all eight texts. Reasons for other terms on the list not appearing in all texts have been discussed in relation to a similar situation in Table II (p.35).

Turning to sources, one may note that a good portion of the terms of the list were found in the descriptive materials of all texts, while the remaining terms were found in content of from one to seven texts. This variation again points to the policies of different writers with regard to responsibility for presentation of some terms.

Further study of the sources in this table indicate that features named by word combinations were found a less number of times on maps than were the single term features,

Boston University

TABLE VI

TERMS NAMING FEATURES REPRESENTED BY COMPLEXES OF SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map Text								Map Legend Text								Map Caption Text								Context Text								Activities Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Nouns Naming Natural Features																																								
archipelago	x		x	x		x		x																	x	x	x	x		x			x	x	x	x	x	x	x	x
bay	x	x	x	x	x	x	x	x																	x		x	x		x			x		x	x				
branch																									x		x		x	x		x	x		x	x		x		x
cape	x	x	x	x	x	x	x	x																	x		x	x	x		x	x	x	x	x	x	x	x	x	x
canyon	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x			x				
channel	x	x	x	x	x	x	x	x																	x		x	x		x		x	x		x		x			
continent	x		x	x		x		x									x		x		x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
delta	x	x		x	x	x	x	x									x			x	x			x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
distributaries																									x		x	x		x		x	x	x						
district																									x		x	x	x		x									
divide	x		x	x						x		x					x			x		x			x	x	x		x				x		x		x			
estuary																									x	x	x		x	x			x	x						
fiord	x		x		x		x																		x	x	x	x	x	x	x	x	x		x	x		x		x
gap																									x			x	x			x	x							
gulf	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x		x	x	x			
harbor	x		x		x		x										x								x	x	x	x	x	x	x	x	x	x		x	x			
highland	x		x	x		x	x	x	x			x						x		x					x	x	x	x	x	x	x	x	x	x		x	x			
isthmus	x	x		x	x		x																		x		x	x	x		x		x			x	x			
island	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x		x	x	x	x		x
lake	x	x	x	x	x	x	x	x			x		x			x									x	x	x	x		x	x	x	x	x		x	x	x	x	x
land																	x		x	x				x	x	x	x	x		x	x	x	x	x		x		x		x
lowland	x		x	x		x		x	x																x	x	x	x	x	x	x		x	x	x		x	x		x
ocean	x	x	x	x	x	x	x	x																	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
outlet																									x								x							
pass	x	x		x	x			x																	x	x		x	x				x		x	x				
peninsula	x		x		x			x			x		x				x			x				x	x	x	x	x	x	x		x	x		x	x		x		x
piedmont	x			x	x				x		x														x	x	x	x	x	x	x	x	x		x		x		x	
plain	x		x	x		x		x	x	x				x		x									x	x	x	x	x	x	x	x	x	x		x		x	x	x
plateau	x	x	x	x	x	x	x	x	x		x		x		x										x		x		x	x	x	x	x	x	x		x	x		x
ridge																									x	x		x		x			x	x			x			
sea	x	x	x	x	x	x	x	x	x	x			x												x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
shore																									x		x	x		x		x		x	x		x			
sound	x	x	x	x	x	x	x	x																	x		x	x												

TABLE VI (continued)

TERMS NAMING FEATURES REPRESENTED BY COMPLEXES OF SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map Text								Map Legend Text								Map Caption Text								Context Text								Activities Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
strait	x	x	x	x	x	x	x	x			x	x													x	x	x	x	x	x	x	x	x	x	x		x	x		
tributary																									x	x	x	x	x	x	x		x	x		x	x		x	
upland			x	x				x																	x		x				x		x		x			x		
valley	x		x			x					x			x											x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
zone																									x	x	x	x	x	x	x	x		x			x			
range	x		x	x				x																	x		x		x			x	x		x	x				x
system																	x				x				x	x		x		x		x	x		x			x		
hemisphere																									x		x		x				x		x		x			x
eastern	x	x			x																				x			x		x			x	x		x				
western	x		x	x		x		x																	x			x		x		x	x		x					x
northern	x		x	x		x		x																	x			x		x		x	x		x					x
southern	x		x	x		x		x																	x			x		x	x		x	x		x		x		x
B. Nouns Naming Cultural Features																																								
air service																									x	x		x				x	x	x		x				
port																									x	x	x	x	x	x	x	x	x	x		x		x		x
state																	x			x	x				x	x	x	x	x	x	x	x	x	x	x		x	x		
country	x	x		x	x		x		x		x			x											x	x	x	x	x	x	x	x	x	x		x	x		x	
seaport									x		x			x											x	x	x		x	x			x	x						
railroad net									x								x								x								x							
steamship service									x																x								x							
C. Combination of Terms Naming Natural Features																																								
drainage basin																	x								x		x					x								
flood plain																									x	x		x		x		x								
lake "																									x		x		x		x			x		x				
mountain range	x		x	x		x		x																	x	x	x	x	x	x	x	x	x	x		x		x	x	
" system																									x		x		x		x			x	x		x			
" valley																									x	x		x												
river basin	x		x	x	x			x																	x		x		x		x			x						
" course																										x		x				x				x				
" system	x																								x		x		x			x		x						
" valley																									x	x		x			x		x							
ice cap										x		x	x												x	x			x			x								
" sheet	x		x	x		x											x		x	x	x				x		x	x					x							
gulf stream	x	x	x	x			x										x	x		x			x		x	x		x		x										
ocean current										x		x	x				x		x	x					x	x		x	x											
glacial drift	x																x																							

TABLE VI (continued)

TERMS NAMING FEATURES REPRESENTED BY COMPLEXES OF SEMI-PICTORIAL SYMBOLS

IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
D. Phrases Naming Some Part of Natural Features																																								
mountain peak																									x	x	x	x	x	x	x	x	x	x		x		x		x
" side																									x	x		x	x		x		x	x		x	x		x	
" slope																									x	x	x		x		x		x	x	x			x		
" top																									x	x	x		x		x		x	x	x			x		x
foot of the mountain																									x	x	x		x		x		x	x		x	x		x	
head of navigation																									x	x		x		x		x	x		x		x		x	
mouth of the river	x		x	x		x		x																	x	x			x		x		x	x		x		x		x
source " " "																									x		x		x		x		x		x		x	x		

Total - 75 terms

such as "bay" and "cape," etc. This is to be expected from the nature of the ideas expressed by these combinations. They need to be read from maps through knowledge of single symbols. "Source of a river," "foot of the mountain," are examples of features which cannot be well shown on maps by single symbols or by combinations which are so quickly or so easily recognized as are the complexes which make up "bay" or "cape."

The large proportion of special terms in this list, together with the fact that they are spread through all the sources, suggests that they are of importance in a map vocabulary.

Terms used in expressing descriptive ideas to be gained from maps about features shown by semi-pictorial symbols.-- These terms are listed in Table VII. The following statements illustrate some of the types of descriptive facts to be read from semi-pictorial symbols about the features symbolized.

> The river system is large, for the main river is long and has many long tributaries. The current of the main river flows from the source down stream in a northeasterly direction. The river has three mouths, for it has built a small delta and empties into the sea through three distributaries. The lower part of the main stream is much wider than the upper part, and the width of the river basin is greatest along the lower part. The slope of the bed is in some places so steep that there are falls in the river.

Similar groups of statements about other features named in the two preceding tables would reveal that, while

some of the specific terms used in describing them differed, the general types, which they express are much the same. Abstract nouns which indicate the types of characteristics mentioned in the ilustrative paragraph are "width" and "slope." The ideas of size, length and trend are expressed without using those terms, for to say "the main river is long," is synonymous with saying "the length of the main river is great."

It was desired to group the words in the table in such a way as to reveal as much as possible about their specific function in expressing descriptive ideas about the types of features involved. One group, "abstract nouns naming a general type of characteristic of the features involved," was selected. Since this was a cumbersome table column heading, the abbreviated heading, "Names of General Types of Characteristics" is there used. In cases where the actual term was not found but where the idea was expressed in another form, the term was entered in brackets, because it almost certainly would be used in oral expression of the facts noted. "Location," "direction," and "distance" were not entered because they had been listed in Table III under orientation symbols found on maps of all types.

Another group of words discernible in the illustrative sentences includes those terms or combinations of terms which qualify size, shape, surface, and the like. Since in many cases the same words which are used to

qualify these abstract nouns also are used to qualify the feature names, qualifying terms linked with feature names also were included in this group. These terms could be separated into lesser groups on the basis of the major type of characteristics they indicated, and so were tabulated under the column headings, such as "adjectives indicating kind or nature of features shown," "adjectives indicating size, shape or number of features shown."

In order to retain the combination idea, there were entered, not as new vocabulary items, but following (i.e., on the same line and opposite), the adjectives, the names of typical features with which the terms were found associated. In the case of terms where no specific typical association is pointed out, the term is one which is found used with a very wide variety of features, such as the term "many."

Adjectives expressing specific distance and direction, such as "northeastern," "hundreds of miles," were not entered because they had been treated for maps of all types in earlier tables, but adjectives expressing general location (e.g., "coastal states") which can be read from a semi-pictorial map were entered under the caption, "Adjectives or Adverbs expressing general location."

It is to be noted that some of the words entered as adjectives may be used in other connections as nouns, but the combinations in which they were found show that they

are properly classified as adjectives. "Steamer," for example, when used in the combination "steamer route," is a qualifying term indicating the kind or nature of the route.

Qualifying or descriptive ideas were found expressed also by adjective or adverbial phrases or subordinate clauses. For example, in the illustrative sentences are found "current of the main river," "flows from the source downstream," "empties into the sea," "along the lower part," "so steep that there are falls in the river," and "much wider than the lower part." As in the case of every category including descriptive terms, it was difficult to handle the terms in these phrases or clauses in such a way as to (1) indicate the types of combinations as a whole; (2) avoid duplication in the finished list, and (3) enter new, significant terms in a way which clearly indicated their specific function in the expression of descriptive ideas. The best device found was much like that employed in Table III. Types of prepositional or conjunctive combinations (the nouns in which may be greatly varied) are grouped, together with parenthetical sample nouns in the combinations found, under the caption "Prepositional or Conjunctive Phrases."

In new terms (noun, adjective, adverb or verb) occuring in these phrases involved, they form another group which could be listed under the caption "New Terms Found in

Descriptive Phrases or Clauses." In this category, however, there were found no terms in the phrases which had not been listed in some other connection, excepting the adverbs "upstream" and "downstream," importance of which was apparent from the phrase using it.

There remained still another lesser group which was not illustrated in the sentences about river, because terms in it apply to cultural items, not natural. Reading from a map the ideas that can be gained about the cultural features symbolized thereon involves not only ability to name and identify the symbols and translate them into the features for which they stand, but also the ability to translate them into *activities* which they indicate. The symbols for capitals, for example, indicate that *government work* is carried on at that place. All such terms were grouped under the heading "Terms Naming Activities Indicated by Symbols."

Analysis of Table VII.-- This list which contains one hundred twenty terms is longer than any preceding set of terms, even though the list had been shortened as much as possible by omitting terms which would in any manner duplicate any terms already set down and by listing types rather than complete lists where it seemed practicable. Footnotes in the table explain what was done in this respect (p. 63).

A study of those terms found in all eight texts

TABLE VII

TERMS USED IN EXPRESSING DESCRIPTIVE IDEAS GAINED FROM SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Names of General Types of Characteristics																																								
size																									x	x		x					x	x		x	x		x	
shape																									x		x		x	x			x		x		x			
kind																	x		x		x	x			x															
length																									x	x		x		x			x			x				
width																									x	x	x		x				x	x			x			
trend																									x		x			x										
surface																	x			x			x		x	x			x											
height									x		x	x					x		x						x	x	x		x	x		x	x		x	x				
depth									x	x		x		x											x		x	x		x			x	x		x				
number of									x	x			x		x										x	x		x	x				x		x					
slope																									x	x		x		x										
drainage																									x	x			x		x									
B. Adjectives Indicating Kind or Nature of Feature Shown																																								
deep (bay)																									x		x		x				x	x		x				
shallow																									x		x	x						x		x				
rugged																									x	x		x	x				x		x		x		x	
irregular																									x	x		x	x				x		x	x		x	x	
low																									x	x	x	x	x	x	x	x	x	x		x	x			
sunken																									x	x		x	x											
glacial (lake)	x		x																						x	x		x	x	x			x		x					
cold (currents									x	x			x				x	x		x		x			x		x						x							
warm									x								x	x		x	x				x		x	x		x										
level (land									x																x	x		x	x				x		x		x			
lower (plains)																									x		x	x		x										
mountainous									x		x	x													x	x	x	x	x	x	x	x	x		x	x	x		x	
rocky (mts.)																									x		x	x					x		x	x	x			
tropical (islands)																									x	x			x				x	x		x				
ancient (lakes)									x	x		x					x		x	x					x		x	x		x										
salt	x		x	x		x																			x		x		x	x										
old (rivers)									x	x		x		x	x										x	x		x	x		x		x	x		x		x		x
swift flowing																									x		x	x		x										
important																									x		x		x											
navigable									x		x	x		x			x		x		x				x	x		x	x		x		x	x		x				

TABLE VII (Continued)

TERMS USED IN EXPRESSING DESCRIPTIVE IDEAS GAINED FROM SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Map Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
dry (land)																									x		x	x												
farm																									x	x		x	x		x		x		x					
bare (mts.)																									x		x			x										
steep																									x	x		x	x											
sharp peaked																									x		x		x		x		x							
tall																									x	x		x		x										
young									x	x		x	x												x		x		x		x		x		x					
volcanic																									x		x	x		x			x							
main stream																									x	x		x	x											
principal (cities)									x	x		x		x											x		x		x				x	x						
chief (seaport)									x		x	x													x	x		x												
manufacturing																									x		x	x		x			x	x						
early (trails)									x	x		x					x	x		x					x	x		x	x											
Spanish	x								x																x															
continental (divide)	x	x		x	x				x	x		x			x										x	x		x	x											
electric power line																	x		x	x																				
national									x		x	x																												
international boundary									x	x		x													x								x							
flat																										x		x												
sail (trade route)									x			x					x		x	x					x			x		x										
steam										x	x			x				x							x															
1/coffee	x		x	x		x			x		x					x		x		x		x			x~~x~~			x	x											
2/mountain (villages)																									x		x			x										
concrete (road)																									x	x		x												
dirt										x		x																												
macadam									x		x			x		x																								
irrigation																	x		x	x					x	x		x		x										
pipe (line)										x		x	x		x			x			x				x		x													
steamer									x		x			x				x		x	x				x	x		x		x										
steamship	x		x		x			x									x		x						x		x		x											
travel										x		x	x																											
transmission									x		x				x																									

TABLE VII (continued)

TERMS USED IN EXPRESSING DESCRIPTIVE IDEAS GAINED FROM SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
C. Adjectives Indicating Size, Shape, and Number of Features																																								
big (delta)																									x		x		x	x			x		x	x				
extensive (lowland)																									x		x	x						x	x		x			
broad																									x	x		x	x											
crooked																									x		x	x		x			x			x				
great	x	x		x	x				x		x														x	x	x		x				x		x	x	x		x	
greatest																									x	x		x	x				x	x		x				
large (city)																									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
larger (island)																										x	x	x					x	x		x				
largest (ocean)									x	x		x													x	x		x		x			x		x		x	x		
little (lake)																									x		x	x		x										
longest (peninsula)																									x	x	x		x	x		x								
narrow (river)																									x		x	x		x										
small																									x	x	x	x	x	x	x	x	x		x	x		x		
smaller (continent)																									x		x	x		x				x	x	x				
smallest (peninsula)																									x	x		x	x											
wide																										x	x		x											
winding (river)																									x	x	x		x	x	x									
whole (world)																									x		x	x	x											
few																									x	x	x	x		x		x								
many																									x	x	x	x	x	x	x	x	x	x	x		x			
huge																									x		x	x		x										
D. Adjectives Expressing General Location																																								
nearest																									x		x	x		x			x	x		x		x		
fringe (land)																										x	x		x		x		x		x	x				
3/California (trail)	x	x		x	x		x										x	x		x	x																			
central (plain)	x		x			x																			x	x			x											
coastal (states)	x	x	x		x			x	x	x		x					x		x	x					x	x	x		x		x	x	x		x	x				
distant (land)																										x	x	x	x		x									
inland (city)									x	x		x					x				x																			
interior									x		x		x																											
nearby																									x		x			x										
transcontinental railroad																									x	x		x	x			x	x		x	x			x	

TABLE VII (continued)

TERMS USED IN EXPRESSING DESCRIPTIVE IDEAS GAINED FROM SEMI-PICTORIAL SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map Text								Map Legend Text								Map Caption Text								Context Text								Activities Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
E. Prepositional Phrases Expressing General Location, Direction or Nature of Features																																								
about the (bay) etc.																									x		x	x												
across the (ocean) "																										x		x	x	x										
along the (coast) "																									x	x	x		x	x				x	x		x			
beyond the (mts.) "																									x	x		x		x			x			x				
down the (river) "																									x	x		x		x		x		x						
from the (ocean) "																									x	x		x	x		x					x				
in the (sea) "																									x		x		x		x			x						
just off the (coast)"																									x		x		x	x		x	x							
near the (sea "																									x	x		x		x			x							
on the (coast) "																									x		x		x		x			x						
over the (land) "																									x	x		x		x		x	x							
toward the (river) "																									x		x		x	x			x							
up the (river) "																									x			x					x		x					
downstream from																									x		x							x						
upstream "																									x			x					x		x	x				
(smaller, larger)than																									x		x		x					x						
F. Terms Naming Activities Indicated by Symbols																																								
[trading]																									x	x		x		x										
exploration																									x	x	x	x	x											
explorers																									x		x	x			x									
travel - transportation																									x	x		x	x											
manufacturing																									x	x		x	x											
fishing																									x	x	x		x			x								
lumbering																									x		x		x			x								
mining																									x	x		x		x		x								
government work																									x	x	x		x		x									

Total - 120 terms

1/ Wool, cattle, wheat and flour are also used in this adjective sense.

2/ Desert, road, railroad, river, seaport, lake, coast, state, island, delta, plateau, fall-line, gulf, lowland and highland are also used in this adjective sense.

3/ Oregon and European are used as modifiers in a similar way.

revealed that only four or about one-thirtieth of the entire list (3 per cent) were thus used.

The terms are of such character that as in the case of preceding lists, synonymous terms may be used.

The ideas expressed by these terms as a whole are not particularly difficult to understand; neither are the terms themselves far removed from the ordinary, everyday vocabulary of the elementary school child. The words setting forth the general types of characteristics, such as "trend" and "surface," would be apt to give more difficulty than would terms from the adjective list.

Of the latter class of words those indicating size and shape are found more ordinarily in the vocabulary of the child than are those which indicate kind or nature of the features shown. Examples of this former group are "small" and "large," while "tropical" and "ancient" fall into the latter class.

Terms used in reading color band, spot and dot symbols.-- As noted earlier, the chief function of symbols named in Table VIII is not that of depicting features except by implication. Their purpose, instead, is to show the distribution and relative amounts, densities or intensities of given features or conditions, the nature of which can be known only by the use of the legend accompanying the map.

In the case of color bands and spots, this purpose is

accomplished by varying the color of different regions or areas, letting a given shade or color stand for a certain amount or density. Thus, a given amount is shown by a given color, while distribution is shown by the extent and location of the part or parts of the map on which the color appears.

Various terms are used in naming the areas thus represented, such as "regions," "areas," "land" and the like. Such were first culled from the list of expressions initially classified as belonging to the color band, spot, and dot category. They are listed in the table under the caption, "Area Names."

In the case of dots, one dot represents a given amount or number of some features. The number of dots in a given area times the amount represented by each dot gives an idea of the total amount in that area of whatever item is involved. One dot may stand, for example, for a given acreage or number of acres of corn, a given production or number of bushels of corn, a given consumption of or number of bushels consumed, and so on. The general type of idea conveyed, then, is indicated by such terms as distribution, amount, density, acreage, and production. Such general terms were next selected and grouped in the table under the caption, "General Distribution and Amount Terms."

One has, however, no idea of exactly what a color

band, spot, or dot map represents unless he knows the specific type of feature or condition, the amount and area distribution of which is shown. Another group of terms used in interpreting such symbols, then, includes "Names of Items, Distribution and Amount of Which are Shown." This group, in turn, falls readily into two divisions, the first including names of "feature" items, such as cattle, people, factories, mines or corn, which have definite form, size, or shape; and the second including names of things which are conditions or "non-features," such as temperatures, rainfall, elevation, and the like. These two groups of words were tabulated under the headings, respectively, "Names of 'Feature' Items" and "Names of Conditions or 'Non-Feature' Items."

Even after one knows, however, that a given map shows the amount or distribution of a given item, he cannot yet interpret that map unless he is familiar with units of measurement employed in determining amounts and in indicating extent of territory in which given amounts are found. One must use such terms as square mile, bushel, bales, dollars, and the like in qualifying phrases or clauses that tell what the map shows. He also must use other qualifying words or groups of words which, either in general or specific terms, indicate amounts of distribution. In the third place, he must use qualifying words or phrases which indicate the basis for differentiation of regions

more clearly than a single term does. For example, "The region colored yellow is one having an average annual or summer or winter precipitation which is very heavy, amounting to from eighty or one hundred inches a year."

Typical prepositional and clause combinations used in such qualifying statements are listed under the heading "Prepositional and Conjunctive Phrases," and the remaining terms fall into the group entitled "New Significant Terms in the Qualifying Phrases."

As in the earlier tables, there are indicated the specific types of items with which various qualifying terms are typically associated.

Again, in this table, even though the list had been shortened by omitting terms which would in any manner duplicate terms already set down, the same procedure was followed as in Table VII. Footnotes in the table explain what was done in this respect in Table VIII. (p. 73)

Analysis of Table VIII.-- Of the one hundred sixty-five terms in this list, forty-five (27 per cent) of the entire group were found in all eight texts.

The table shows a rather wide spread of sources for this type of symbol, especially through that section of the table which relates to items for which distribution and amounts are shown. This leads one to see that special attention is given in texts to these items, not from one angle but from several. For instance, distribution

TABLE VIII

TERMS USED IN READING COLOR BAND, DOT OR SPOT SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Area Names (nouns)																																								
area												x						x		x					x															
belt or belts	x			x													x			x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
field or fields		x			x					x			x					x			x				x	x		x	x		x		x	x		x	x		x	
land or lands					x	x							x	x							x	x																		
project										x		x		x				x				x		x		x			x	x						x		x		
region				x			x	x						x											x		x	x												
territory											x		x														x			x					x					
section																									x		x	x	x				x		x	x	x			
B. General Distribution and Amount Terms																																								
amount of (corn produced or area producing corn)												x						x	x	x		x				x		x	x			x				x	x			
acreage of												x						x	x	x		x				x		x	x			x				x	x			
consumption of																					x			x																
distribution of (people and regions)												x		x				x		x	x	x				x		x		x										
location of											x	x		x		x		x			x					x														
extent of (possessions)																				x		x						x		x										
production of (given amount of)												x		x		x		x				x		x				x		x		x				x		x		x
rank of (given area and amount of production)																						x		x						x		x								
value of (amount produced)																				x		x		x				x		x		x								
density of (population-rainfall)																										x		x												
proportion of (total land area used)																										x		x		x										
C. Names of Items, Distribution or Amount of Which is Shown																																								
1. Names of "feature" items																																								
a. People & Nations																																								
inhabitants						x						x		x																										
people										x		x		x		x									x			x				x		x						

TABLE VIII (continued)

TERMS USED IN READING COLOR BAND, DOT OR SPOT SYMBOLS

IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
population												x		x		x		x		x		x		x	x	x	x		x	x			x	x		x	x		x	x
*Belgium														x		x																								
Eskimos														x		x									x						x									
b. Animals																																								
beef cattle																x	x	x		x	x		x		x	x		x	x		x									
cattle																		x		x	x		x																	
dairy cows	x								x			x		x		x	x			x					x	x	x	x	x	x	x	x	x	x		x				x
goats									x			x		x			x			x					x		x	x	x				x	x		x				
sheep	x								x			x	x				x		x	x	x		x		x	x	x	x	x	x	x	x	x	x		x		x		x
hogs									x			x				x			x	x				x	x	x		x			x									
c. Vegetation																																								
trees									x	x		x		x											x	x		x	x				x	x		x				
forests	x	x			x	x			x	x				x		x	x		x						x	x	x	x	x	x	x	x	x	x		x		x	x	
desert veg.										x		x			x																									
woods	x	x		x			x			x		x			x		x		x	x		x	x		x	x	x	x	x	x	x	x	x		x	x		x		
hardwoods										x	x		x		x				x	x					x		x	x	x				x							
d. Kinds of Land																																								
woodland								x		x		x				x									x	x	x	x	x	x	x	x	x		x					
upland										x	x		x																											
grassland										x	x		x													x	x		x					x	x		x			
tundra									x		x	x		x											x		x	x					x		x	x				
farmland	x		x		x		x		x		x	x		x											x	x	x	x	x	x	x	x								
prairie																									x	x	x	x	x	x	x	x	x		x					x
swamps					x			x			x	x			x										x	x	x	x	x	x	x	x	x	x			x			x
orchards														x		x								x			x		x			x		x		x				x
marshes												x		x							x			x			x		x	x		x		x		x		x		x
e. Agricultural Products																																								
crops										x		x			x			x		x				x		x			x		x									
cotton	x		x	x		x											x		x	x		x			x	x	x	x	x	x	x	x	x	x	x		x	x		
citrus fruits		x			x													x		x	x		x		x	x	x	x	x	x	x	x	x		x	x		x		x
cranberries																		x		x			x		x		x	x		x		x								
nuts																		x		x			x			x		x			x			x			x			
vegetables		x						x										x			x			x	x	x		~~x~~	x				x		x	x				
alfalfa										x		x	x					x			x			x	x		x		x			x								
barley	x		x		x	x			x		x		x	x											x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
corn	x		x		x	x																			x	x	x	x	x	x	x	x	x	x	x	x				

TABLE VIII (continued)

TERMS USED IN READING COLOR BAND, DOT OR SPOT SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
flax																			x		x																			
forage																			x		x																			
flour																					x			x		x	x			x		x								
hay		x				x												x			x																			
oats		x				x						x		x		x		x							x	x		x		x	x									
potatoes		x				x								x		x																								
rice																				x																				
spring wheat		x				x								x						x																				
sugar		x				x								x						x					x	x	x		x		x		x	x		x				
sugar beets		x			x	x						x					x		x						x		x		x				x	x						
sugar cane					x	x						x													x	x	x		x		x	x								
wheat	x		x		x	x	x	x		x	x	x	x	x	x	x		x	x	x		x	x		x	x	x	x	x	x	x	x	x	x		x	x		x	
winter wheat		x		x														x		x					x	x	x	x	x	x	x	x								
tobacco					x	x		x										x		x			x		x	x	x	x	x	x	x	x								
dairy products		x			x	x		x			x		x					x		x			x																	
f. Relating to																									x	x		x	x		x									
Manufacturing																										x	x		x			x		x	x					
blast furnaces																									x	x	x		x	x	x	x	x		x	x				
factories																				x		x		x																
mills																				x		x		x																
mines																										x		x	x						x	x	x			
lumber		x		x		x																			x	x		x	x				x	x		x				
cotton goods		x				x																			x	x		x		x			x	x			x			
g. Relating to																									x		x			x										
Mining																									x		x		x			x								
coal		x				x						x		x		x					x		x		x			x					x			x				
copper										x		x		x	x																									
gas		x				x						x								x		x		x																
oil		x				x						x								x		x		x																
petroleum														x		x				x		x		x																
gold											x		x		x										x	x		x		x			x	x		x		x		
silver											x		x		x										x	x		x		x			x	x		x				
lead											x		x		x										x	x	x	x	x	x	x	x	x		x					
zinc											x		x		x																									
iron		x			x			x																	x	x	x		x	x										
iron ore										x	x		x		x											x		x	x	x				x		x				
steel		x			x			x																																
metal ores																		x		x																				

TABLE VIII (Continued)

TERMS USED IN READING COLOR BAND, DOT OR SPOT SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
h. Miscellaneous																																								
soil													x		x					x		x	x		x	x														
parks	x	x	x		x	x	x			x		x		x					x	x	x		x						x			x				x				x
residence										x		x		x											x	x	x	x	x	x	x	x		x	x					
trading post											x	x		x		x			x	x			x		x	x	x	x	x	x	x	x	x	x		x				
2. Names of Conditions																									x	x	x	x	x	x	x	x	x	x		x				
or "non-feature"																									x	x	x	x		x	x									
items																									x		x					x								
altitude																									x	x	x	x	x	x	x	x	x		x		x			
elevation		x		x	x		x			x		x	x		x			x		x	x							x			x			x		x				
precipitation																									x	x	x	x	x	x	x	x	x		x	x		x		
rainfall					x	x			x	x	x	x	x	x	x	x	x		x	x		x			x	x	x	x	x	x	x	x	x		x	x		x		x
aridity																									x	x	x	x	x	x	x	x	x		x	x		x		x
temperature																									x	x	x	x	x	x	x	x	x		x	x		x		x
weather										x	x		x												x	x	x	x	x	x	x	x	x		x	x				x
time	x		x		x												x	x	x		x	x	x	x																
seasons											x	x						x	x		x																			
climate																									x		x	x		x		x								
D. Prepositional and																									x					x										
Conjunctive Phrases																																								
(1 dot) equals (100 people)											x	x													x	x	x	x	x	x	x	x	x	x		x	x			
(height) above (sea level)		x			x	x				x			x	x											x	x		x	x		x									
(rainfall) over (ten in.)	x		x	x			x		x	x		x	x		x	x									x	x			x				x		x		x			
" more than " "										x	x		x	x																										
" below " "										x	x		x	x																										
" less than " "									x		x			x											x	x	x	x	x	x	x	x	x	x		x	x			x
" under " "									x	x	x	x	x	x	x	x									x	x	x	x	x	x	x	x	x	x		x	x			x
pop. per sq. mile											x	x		x											x	x	x	x	x	x	x	x	x	x		x	x			x
E. New Significant Terms																									x	x	x	x	x	x	x	x	x			x	x			
Found in Qualifying																									x	x		x	x			x	x			x	x			
Phrases																									x	x	x	x	x	x	x	x	x		x	x	x			
summer										x		x	x					x		x	x				x	x	x	x	x	x	x	x	x	~~x~~	x	x	x			~~x~~
winter										x		x	x					x		x	x		x			x	x	x	x		x		x		x					
sea level	x	x		x		x			x	x		x	x	x	x											x	x	x	x		x									
acres											x		x	x				x		x	x				x	x	x	x	x	x	x	x	x	x		x				x
bales																																								
bushels			x	x	x	x				x			x						x		x					x	x		x		x		x	x		x				
																									x		x		x					x						

TABLE VIII (continued)

TERMS USED IN READING BAND, DOT OR SPOT SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

Term or Phrase	Source																																							
	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
F. Adjectives Naming Ideas about Amount and Distribution																																								
Atlantic	x		x	x		x	x																		x	x		x		x			x	x		x				
Pacific	x		x	x		x	x																		x	x		x		x			x	x		x		x		
Arctic	x		x	x		x	x			x	x			x																				x		x				
coal producing (region)																	x	x		x	x				x	x		x	x	x			x		x		x	x		
hot (land										x	x			x											x	x		x	x	x										
forested																	x	x		x	x		x		x	x		x					x	x		x				
sub-tropical									x		x		x																											
irrigated																	x	x		x		x			x	x	x	x	x	x	x	x	x	x	x		x			
tropical																																								
temperate										x	x		x		x										x	x	x	x	x	x	x	x	x	x		x	x		x	
torrid	x	x		x	x																				x	x	x	x	x	x	x	x	x	x		x	x	x	x	
wet																									x	x							x	x						
bordering										x	x	x																												
interior										x	x	x																												
cultivated (area)																x								x	x	x	x	x	x	x	x									
residential																x																								
industrial (land)												x	x					x								x														
business (district)												x	x																											
retail												x	x																											
frigid) belts or			x		x						x		x													x	x		x											
polar) zones											x		x													x	x		x											
farming (land										x		x																												
grassy (section)										x		x													x	x	x	x		x										
grazing																									x	x	x	x	x	x	x	x								
barren										x		x	x																											
idle																									x	x	x	x	x	x	x									
dry												x	x						x						x			x												
mineral																			x						x		x						x		x					
rough												x	x																											
pasture																									x	x	x		x	x	x	x	x	x	x					
sparse										x		x		x												x	x							x	x					
rural										x		x		x				x		x	x																			
annual (rainfall)										x		x		x				x		x	x				x	x		x												

TABLE VIII (continued)

TERMS USED IN READING BAND, DOT OR SPOT SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
average (rainfall)										x		x		x				x		x	x				x	x		x												
heavy "																									x	x	x	x		x		x								
colonial (territory)											x	x		x		x																								
native											x	x	x		x																									
cloudy (weather)																									x	x		x	x											
frosty																									x	x		x	x											
moist												x	x	x																										
rainy												x	x	x																										
cold (temperature)											x	x		x																										
alluvial (soil)																									x		x	x	x		x									
sandy																									x	x		x	x		x									
glacial			x	x			x																																	
standard (time)			x	x				x										x	x		x			x																
reclamation (project)												x																												
leather																							x						x		x									
short														x																										
soft										x																x														
tall														x																x										

* France, Great Britain, United States, Italy, Spain, India and the Indians the same manner.

Total - 165 terms

or amounts of "coal" and "steel," "barley" and "corn" are given in three or four sources in each case. That is, their distribution or amount or both are shown on maps, indication of the type of distribution or amount is shown in the legend and caption of the maps, and further information about the features is given in the content of the text. This seems to leave little for the teacher to do, but other items in this category are more complicated in nature.

In Class D which lists the phrases are certain combinations relating to rainfall or population or sea level, etc. The terms "above," "over," and "more than" are synonymous, as are the following three: "less than," "below" and "under." Unless the child is helped to visualize what is meant by "over" ten inches of rainfall, is guided to see that "more than" ten inches and "above" ten inches have the same meaning as "over" ten inches, he is liable to become confused in his attempts to interpret the symbols, no matter how many maps showing this distribution and using the particular terms may appear in the texts. Therefore, in this list those terms grouped under area names, distribution and amount terms, and the prepositional and conjunctive phrases are liable to prove difficult for the child unless he is guided in his map study.

Terms used in interpreting iso-line symbols.-- As shown on Table IX very few iso-line symbols are employed

in the texts examined. There are, of course, iso-lines on many of the color band, spot and dot maps, but those maps are interpreted in terms of the colors employed between the lines rather than in terms of the lines. Temperature belts are depicted, for example, on maps in which iso-therms are noted as such.

The function of iso-line maps is similar to that of color band, spot and dot maps in that they show distributions, intensities, and ratios of various items which are represented only by implication.

The only new types of ideas to be read from the very few iso-line maps presented had to do with the specific nature of the item, the distribution of which was depicted. They were grouped into two lists, one including "Terms Indicating the Type of Item, Distribution of Which is Shown," and the other, "New and Significant Terms used in Describing Items."

Analysis of Table IX.-- The total number of terms, fourteen in this category, is small as compared with preceding lists. Only one, "length of growing season," appeared in seven of the texts.

Study of the table reveals very little use in any text of the few symbols listed. When they do appear, they are used in several sources, namely, on maps, in map legends, captions and in some cases, in the content and activities of the text. Presentation of the terms

TABLE IX

TERMS USED IN INTERPRETING ISO-LINE SYMBOLS IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Source																																							
Term or Phrase	Map								Map Legend								Map Caption								Context								Activities							
	Text								Text								Text								Text								Text							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
A. Types of Items - distribution of which is shown																																								
advance of (boll weevil)	x	x		x	x												x	x		x	x							x								x				
length of (growing season)	x	x		x	x							x	x				x	x		x	x				x			x								x				
path of cold waves		x		x														x			x					x			x								x			
planting date		x		x								x	x					x			x				x	x			x											
average annual temperature		x			x		x			x		x				x		x			x		x																	
cyclone area	x	x			x																				x	x			x	x										
B. New Significant Terms used in describing items																																								
boll weevil	x	x			x	x											x								x		x	x		x			x		x					
growing season	x	x		x	x	x		x			x		x		x				x		x		x		x		x	x	x											
cold waves	x		x		x	x											x		x		x	x			x		x	x		x										
cyclonic																									x		x	x	x											
" center	x		x	x		x											x		x	x		x			x	x		x					x	x		x				
" path	x		x	x		x											x		x	x		x			x		x		x		x		x		x	x		x		
frostless	x	x		x		x		x	x	x		x		x			x		x	x		x			x															
contour (lines)		x		x		x											x		x		x				x		x		x	x										

Total - 14 terms

from more than one viewpoint would tend to strengthen the approach to these abstract symbols, interpretation of which is of a high order of difficulty for fith grade or elementary geography.

That sparing use should be made of iso-line terms seems to be the opinion of all authors concerned. The very concrete nature of the ideas so presented is evidence that ideas of this type which are presented should be the more simple ones.

Comments concerning the conclusions.-- Before final conclusions regarding the vocabulary of map terms set forth in this chapter can be drawn, certain facts which may help to clear up some minor questions about the list should be noted.

In the first place, some terms entered may not be thought necessary to a final vocabulary. However, they are included for the purpose of showing types of synonymous terms used in the various texts examined.

A further note of explanation may be necessary in relation to selection of terms.

(A) For the sake of brevity and as an aid in eliminating duplications, only the singular number of each term was set down in arranging the final list.

(B) The term "scale" is used in two categories. The first use was in Table II, which names the nature of symbols where scale means measuring device for determining

distances between places, or from one point to another. "Scale" was repeated in Table IV, which lists terms used in expressing descriptive ideas about orientation symbols. Here the meaning is that scale upon which a map is drawn, as "a large scale map" or "one map is drawn on a larger scale than another."

In order, in summarizing, to see all major symbol groups as a whole and all major function groups as a whole, the symbols were reduced to five, including all semi-pictorial symbols (Tables V, VI, and VII) in one group, and all orientation terms (Tables III and IV) in another.

Findings concerning terms, types of terms, and text frequencies.-- The major findings from Tables II to IX inclusive are presented in Tables X and XI.

The important points to be noted are:

1. The total number of terms of all types, including some distinctive two or three word and phrase combinations, is 502. (Table X)

2. These terms serve four major functions, namely, naming features symbolized; naming conditions symbolized; qualifying those features or conditions or symbols; and naming symbols of complexes of symbols. (Table X)

3. They relate to five types of symbols: general or miscellaneous orientation, semi-pictorial, color band, dot or spot, and iso-line symbols. (Table X)

4. In number of terms, the function groups noted rank in the following order, beginning with the

TABLE X

502 MAP TERMS CLASSIFIED ACCORDING TO TYPE OF SYMBOL AND TO FUNCTION IN EIGHT FIFTH GRADE GEOGRAPHY TEXTS

	Type of Symbol					
Function	Nature of Symbols (general)	Orientation	Semi-Pictorial	Color Band, Dot, Spot	Isoline	Total
Features	---	---	98	72*	---	170
Conditions	---	---	12	32	6	50
Descriptive Ideas	29	48	108	61	8	254
Naming Symbols	10	18	---	---	---	28
Total	39	66	218	165	14	502

* Features by implication included

TABLE XI

PERCENTAGE OF 502 MAP TERMS CLASSIFIED UNDER EACH OF FIVE TYPES OF SYMBOLS AND FOUR FUNCTIONS

	Type of Symbol					
Function	Nature of Symbols (general)	Orientation	Semi-Pictorial	Color Band, Dot, Spot	Iso-line	Total
Features	---	---	19.5	14.3	---	33.8
Conditions	---	---	2.4	6.4	1.2	10.
Descriptive Ideas	5.8	9.6	21.5	12.1	1.6	50.6
Naming Symbols	2.	3.6	---	---	---	5.6
Total	7.8	13.2	43.4	32.8	2.8	100.0

highest (Table XI):

(1) Terms used in expressing descriptive ideas, 50.6

(2) Terms used in naming features, 33.8

(3) Terms used in naming conditions, 10.

(4) Terms used in naming symbols, 5.6

5. In number of terms, the "types of symbol" groups ranks in the following order, beginning with the highest (Table XI):

((1) Terms relating to semi-pictorial symbols, 43.4

(2) Terms relating to color band, dot, spot symbols, 32.8

(3) Terms relating to orientation symbols, 13.2

(4) Terms relating to "nature of" symbols, 6.2

(5) Terms relating to iso-line symbols, 2.8

6. Of the 502 terms listed, 132 or 26.3 of the total appeared in all the texts. Of these 132, the color band, dot, and spot symbols constituted the largest group, and the semi-pictorial group of terms the next largest.

CONCLUSIONS BASED ON THESE FINDINGS

1. The number and variety of terms found are great enough to warrant the writer's earlier tentative belief that the mastery of map-reading terms constitutes an aspect of geographic learning on fifth grade level and beyond which probably requires considerable emphasis and special attention in the teaching process.

2. Recognition of the specific functions which different groups of terms serve and the specific types of

symbols to which they refer should be helpful in further experimentation for the purpose of discovering the most effective procedure in leading children to master these terms. It may well be that learning to use feature names correctly is easier than learning terms or phrases needed in characterizing those features, or vice versa. It may well be, too, that the technique of one type is much less effective than other procedures where terms of another type are involved.

3. In view of the foregoing conclusion, it seems as necessary to train children in the correct use of combinations as in the correct use of "symbol," "feature," "condition," and other single terms. It seems, too, that failure to pay enough attention to types of combinations, as is failure to emphasize distinctive terms sufficiently, may be a source of some of the difficulty children experience in reading maps.

4. Even before extended scientific studies are made of the relative value of the various terms listed, the fact that such a large majority of them fall into the semi-pictorial and color band, dot and spot groups suggests the desirability of centering teaching emphasis for the present, at least, upon those groups of terms.

5. Also, the large number of descriptive or qualifying terms within these two groups suggests that teachers may well give more attention than seems commonly

given to such terms.

6. Writers of texts are endeavoring through their texts to give the child experiences, broad and rich, which he cannot get first hand. Much of this experience is to be gained through the skillful reading of maps.

7. Finally, in as far as consensus of opinion is revealed by the use of given terms in all eight texts, it is clear that since more than twenty-five per cent are used in all texts, at least 132 of these terms are commonly considered necessary. In so far as the writer is concerned, if a final list of map terms for fifth grade geography is ever scientifically compiled, it would seem probable that a great majority of the map terms of this study would be included.

CHAPTER V

GENERAL CONCLUSIONS

1. The refined list of map reading terms presented in Chapter IV was gleaned from an initial "work sheet" list of more than eight hundred words and phrases found in the eight textbooks examined. Each of these eight hundred words differed in some respect from every other. By comparison and elimination of those which differed insignificantly from the others, the list was reduced to five hundred two terms. Further investigation may show that not all of these are essential, but it seems reasonably safe to assume that approximately some four hundred of these terms need to be mastered by the child in the course of his elementary training, Grades Four, Five, Six, if he learns to read maps well.

2. Classification of these terms with regard to their function threw light on some of the difficulties the writer had encountered in helping children develop a satisfactory map reading vocabulary. The fact, for example, that some feature terms are commonly applied to symbols themselves, while other non-feature terms name the symbol only, indicated a source of confusion that may exist in

the child's mind. It seems safe to conclude that recognition of the functions differentiated should aid teachers in tracing map-reading errors to their sources and planning sound preventive and remedial measures.

3. The findings in Chapter IV reveal that, in spite of marked differences in texts examined, there is considerable uniformity in the number of types of terms thought necessary by the various authors.

4. Since it was apparent from findings in Chapter IV that a bulk of the initial mastery of elementary map terms is probably delegated to grade five, it seems even more necessary to take great pains to so introduce the terms needed at this level as to promote best that mastery.

5. Marked differences were revealed in the stress which various authors put upon careful explanation of the terms introduced. It may be questioned as to whether it is the responsibility of the text or the teacher to so explain each new term, but it seems certain that teachers should note those terms which are not sufficiently explained and supplement them accordingly.

6. It became apparent in the course of the study that mere frequency of use is in some cases no index of importance. Care should be taken not to draw unwarranted inferences from this point of view.

7. Care should be taken, too, not to assume that stress on a given term and frequency of use of it are synonymous, a term used once only may receive more stress than one used many times if the one used only once is so introduced and explained that it is really understood.

In conclusion, it should be noted that the list in Chapter IV is not set forth as final but is presented with the idea that it may be a step toward the solution of the problem of a properly graded list for Grade Five. The writer's initial feeling that the problem of teaching children to read maps was a huge one was not lessened by this study. The study strengthened the belief that training in map reading should be put upon a basis of levels of very gradually increasing difficulty.

To quote Thorndike,[1]

> "In educational theory, then, we should not consider the reading of a textbook or reference as a mechanical, passive, undiscriminating task, on a totally different level from the task of evaluating or using what is read. While the work of judging and applying doubtless demands a more elaborate and inventive organization and control of mental connections, the demands of mere reading are also for the active selection which is typical of thought. It is not a small or unworthy task to learn 'what the book says.'"

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[1] Edward L. Thorndike, "Reading as Reasoning: A Study of the Mistakes in Paragraph Reading," Journal of Educational Psychology, VIII, (June, 1917) pp. 323-332.

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